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EXAMINER
PATTERSON, MARC A

ART UNIT	PAPER NUMBER
1772	7

DATE MAILED: 11/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/540,028	REIF ET AL.	
	Examiner	Art Unit	
	Marc A Patterson	1772	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 August 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-60 and 65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-60 and 65* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

WITHDRAWN REJECTIONS

1. The 35 U.S.C. 112, second paragraph rejections of Claims 1, 24, 26, 32, 39 and 42, and the 35 U.S.C. 102(b) rejection of Claims 20, 29, 34 – 35, 52 – 57 and 65 as being anticipated by Reese Jr. (U.S. Patent No. 5,667,866), and the 35 U.S.C. 103(a) rejection of Claims 22 – 28, 30 – 33, 36 – 48 and 60 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866), and the 35 U.S.C 103(a) rejection of Claims 49 – 51 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866) in view of Komai et al. (U.S. Patent No. 6,238,783), and the 35 U.S.C. 103(a) rejection of Claims 58 – 59 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866) in view of Clark (U.S. Patent No. 6,004,652), of record on page 2 of the previous Action, are withdrawn.

REPEATED REJECTIONS

2. The 35 U.S.C. 112 second paragraph rejection of Claims 26, 32, 39 and 42, of record on page 2 of the previous Action, is repeated.

NEW REJECTIONS

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention. The phrase 'connecting point' is indefinite, as it is unclear what the point connects. For purposes of examination, the phrase will be assumed mean any insert. The phrase 'and result in an equilibrating of the elastic modulus and the coefficient of thermal expansion between the plastic material and the insert' is indefinite, as the phrase is directed to a desired result, rather than to a structural limitation. The meaning of the term 'equilibrating' is also unclear. For purposes of examination, the phrase will be assumed to mean that the coupling layer is any coupling layer which changes uniformly in elastic modulus or coefficient of thermal expansion in the coupling layer. The phase 'so as to reduce' is also indefinite, as the phrase is directed to a desired result, rather than to a structural limitation. The phrase 'kind of fiber' is indefinite, as it is unclear what the difference in the fibers is (chemical, physical, etc.). The term "abrupt" in claim 20 is a relative term which renders the claim indefinite. The term "abrupt" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 20, 34 – 35 and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawai (European Patent No. 0528131).

With regard to Claims 20, 34 – 35 and 49, Kawai discloses a plastic structural element (a composite for use in aeronautics; page 2, lines 11 – 17) comprising laminated sheets of a fiber – reinforced plastic material (the plastic is acrylamide resin; page 8, lines 6 – 10); the fiber content of the base sheets (therefore the volume fraction of fibers) decreases from the center layer of the laminate to the outermost layers (page 3, lines 22 – 31), thus reducing the difference between the thermal expansion coefficient of the center layer and outermost layers; the structural element therefore comprises an insert (the center layer) having a length embedded in the plastic material (the outermost layers) so that a portion extends from the plastic material (the structural element is a laminate) the insert exhibiting a different thermal expansion coefficient compared to the plastic material, and a plastic coupling layer of fiber reinforced plastic (the layers between the center layer and outermost layers) joining the insert to the plastic material, the coefficient of thermal expansion changing uniformly in the coupling layer.

7. Claim 65 is rejected under 35 U.S.C. 102(b) as being anticipated by Reese Jr. (U.S. Patent No. 5,667,866).

With regard to Claim 65, Reese Jr discloses a plastic structural element (bonded sandwich panel; column 2, lines 5 – 21) comprising a plastic material (epoxy; column 2, lines 5 – 21) and at least one insert (honeycomb core; it therefore has finger – shaped projections that lie parallel; column 2, lines 5 – 21) embedded in the plastic material (the element is a sandwich); the insert is aluminum (column 3, lines 12 – 15) and therefore exhibits a different elastic modulus compared to the plastic.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 21 – 22, 25 – 26, 28 – 33 and 36 – 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese (U.S. Patent No. 4,546,880).

Kawai discloses a fiber – reinforced plastic structural element comprising acrylamide resin as discussed above. With regard to Claims 21 and 29, Kawai fails to disclose a fiber – reinforced plastic structural element comprising reinforced plastic in an epoxy resin matrix.

Reese teaches that acrylamide resin and epoxy resin are equivalent in the making of a fiber – reinforced composite (column 6, lines 38 – 68; column 7, lines 1 – 25) for the purpose of making a composite which is moisture – impervious (column 5, lines 20 – 29).

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for epoxy resin (therefore a fiber – reinforced plastic structural element comprising reinforced plastic in an epoxy resin matrix) in Kawai in order to make a composite which is moisture – impervious as taught by Reese.

With regard to Claims 22, 28, 30 – 33, 36 – 39 the coupling layer disclosed by Kawai contains fiber – reinforced plastic with a fiber content of 40 – 80 volume % (page 5, lines 5 – 20).

With regard to Claims 25 – 26, the fiber – reinforced plastic disclosed by Kawai comprises carbon fiber (page 6, lines 5 – 9).

With regard to Claims 40 – 41, Kawai fails to disclose a plastic structural element wherein the volume fraction of fibers in the coupling layer decreases toward the insert starting from the plastic material. However, as stated above, Kawai discloses a plastic structural element wherein the volume fraction of fibers in the coupling layer increases toward the insert starting from the plastic material. Therefore, the volume fraction of fibers would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end use of the product. It therefore would be obvious for one of ordinary skill in the art to vary the volume fraction of fibers, since the volume fraction of fibers would be readily determined through routine optimization by one having ordinary skill in the art depending on the desired end result as shown by Kawai. *In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980).*

10. Claims 23 – 24, 27, 45 – 48 and 52 – 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese (U.S. Patent No. 4,546,880) and further in view of Reese Jr. (U.S. Patent No. 5,667,866).

Kawai and Reese disclose a plastic structural element comprising an insert, a coupling layer and a plastic material as discussed above. With regard to Claims 23 – 24, 27 45 – 48 and 52 – 57, Kawai and Reese fail to disclose a plastic structural element comprising glass fiber, and a plastic structural element comprising glass fiber and carbon fiber, and an insert having an enlarged surface area formed by openings which are hook – shaped elements formed by bends in the embedded length and an insert shaped as an anchoring element.

Reese Jr teaches that glass fiber and carbon fiber are equivalent as reinforcement for a plastic structural element for the purpose of forming a structural element having improved load carrying properties (column 2, lines 15 – 21). Reese Jr. also teaches the use of an insert having a honeycomb shape (column 3, lines 16 – 19) for the purpose of forming a structural element having improved load carrying properties (column 2, lines 15 – 21).

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for glass fiber and an insert having a honeycomb shape (therefore having an enlarged surface area formed by openings which are hook – shaped elements formed by bends in the embedded length; the embedded length therefore shaped as an anchoring element) in Kawai and Reese in order to form a structural element having improved load carrying properties as taught by Reese Jr.

11. Claims 42 – 44 and 60 rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese Jr. (U.S. Patent No. 5,667,866).

Kawai discloses a plastic structural element comprising aluminum, in which the coupling layer is a layered composite, as discussed above. Kawai fails to disclose a plastic structural element in which the fibers in individual layers of the structure are oriented in at least one direction, the fiber layers next to the plastic material being aligned 30 to 70 degrees relative to each other.

Reese Jr. teaches the orientation of fiber layer relative to each other in a layered composite (column 2, lines 22 – 38) for the purpose of forming a structural element having improved load carrying properties (column 2, lines 15 – 21).

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for oriented fiber layers in Kawai in order to form a structural element having improved load carrying properties as taught by Reese Jr.

With regard to Claims 42 – 44, Reese Jr. fails to disclose a coupling layer wherein the outer and inner layers of the coupling layer are aligned 30 to 70 degrees relative to each other. However, Reese Jr. discloses a coupling layer wherein the inner and outer layers of the coupling layer are oriented perpendicular (column 2, lines 22 – 38). It would have been obvious for one of ordinary skill in the art to vary the orientation of the inner and outer layers, since the orientation of the layers would be readily determined through routine experimentation by one having ordinary skill in the art depending on the desired end result. *In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980).*

With regard to Claim 60, Reese Jr fails to disclose an insert with end parts that are tapered at an acute angle which is the inverse tangent of 1:30 to 1:10. However, Reese Jr. discloses an insert with end parts that are tapered at an obtuse angle which is the inverse tangent of 1:30 to 1:10 (the core is a honeycomb structure; column 2, lines 5 – 21). It would have been obvious for one of ordinary skill in the art to vary the taper of the end parts, since the taper of the end parts would be readily determined through routine experimentation by one having ordinary skill in the art depending on the desired end result. *In re Boesch and Slaney, 205 USPQ 215 (CCPA 1980).*

12. Claims 49 – 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai (European Patent No. 0528131) in view of Komai et al. (U.S. Patent No. 6,238,783).

Kawai discloses a plastic structural element comprising an insert as discussed above. With regard to Claims 49 – 51, Kawai fails to disclose an insert which has an aluminum surface which is anodically oxidized and roughened at the portions receiving the coupling layer.

Komai et al teach that it is well known in the art to anodically treat and roughen an aluminum surface prior to bonding with a thermoplastic resin layer for the purpose of obtain good adhesion (column 1, lines 28 – 65).

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for anodically treating and roughening an aluminum surface prior to bonding with a thermoplastic resin layer in Kawai in order to obtain good adhesion as taught by Komai et al.

13. Claims 58 – 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese (U.S. Patent No. 4,546,880) and Reese Jr. (U.S. Patent No. 5,667,866) and further in view of Clark (U.S. Patent No. 6,004,652).

Kawai, Reese and Reese Jr. discloses a plastic structural element comprising an insert having a honeycomb structure as discussed above. With regard to Claims 58 – 59, Kawai, Reese and Reese Jr. fail to disclose an insert which has force transferring reinforcing aramide fibers which are laminated into the plastic material so as to anchor the insert in the plastic material whereby the laminated – in reinforcing fibers are joined to the insert by a loop type connection.

Clark teaches that in the making of a structural element (structural panel; column 1, lines 10 – 21) the use of a single honeycomb layer is equivalent to the use of two honeycomb layers, which are held together by glass fibers which are woven through the two layers (therefore a loop

connection) for the purpose of creating a panel which withstands high internal pressures (column 1, lines 10 – 21; column 9, lines 31 – 44).

It therefore would have been obvious for one of ordinary skill in the art at the time Applicant's invention was made to have provided for glass fibers which are woven through the two layers (therefore a loop connection) in Kawai, Reese and Reese Jr. in order to creating a panel which withstands high internal pressures as taught by Clark. With regard to the claimed aspect of the fibers being aramide fibers which are reinforcing, force transferring fibers, Kawai, Reese and Reese Jr. teaches that glass fibers and aramide fibers are equivalent as reinforcement for honeycomb structures (column 2, lines 5 – 21 of Reese Jr.); the claimed aspect of the fibers being aramide (and therefore reinforcing, force transferring fibers) therefore reads on Kawai, Reese and Reese Jr; with regard to the claimed aspect of the fibers being laminated into the plastic material so as to anchor the insert in the plastic material, Kawai, Reese and Reese Jr. teaches that the lamination of the honeycomb core and the epoxy layers occurs during the curing of the epoxy (column 4, lines 1 – 27 of Reese Jr.); the claimed aspect of the fibers being laminated into the plastic material so as to anchor the insert in the plastic material therefore reads on Kawai, Reese and Reese Jr.

ANSWERS TO APPLICANT'S ARGUMENTS

14. Applicant's arguments and amended claims regarding the 35 U.S.C. 112, second paragraph rejections of Claim 20 and the 35 U.S.C. 102(b) rejection of Claims 20, 29, 34 – 35, 52 – 57 and 65 as being anticipated by Reese Jr. (U.S. Patent No. 5,667,866), and the 35 U.S.C. 103(a) rejection of Claims 22 – 28, 30 – 33, 36 – 48 and 60 as being unpatentable over

Reese Jr. (U.S. Patent No. 5,667,866), and the 35 U.S.C 103(a) rejection of Claims 49 – 51 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866) in view of Komai et al. (U.S. Patent No. 6,238,783), and the 35 U.S.C. 103(a) rejection of Claims 58 – 59 as being unpatentable over Reese Jr. (U.S. Patent No. 5,667,866) in view of Clark (U.S. Patent No. 6,004,652), of record on page 2 of the previous Action, have been considered and have been found to be persuasive. The rejections are therefore withdrawn. The new 35 U.S.C 112 second paragraph rejection of Claim 20, 35 U.S.C. 102(b) rejection of Claims 20, 34 – 35 and 49 as being anticipated by Kawai (European Patent No. 0528131), 35 U.S.C. 102(b) of Claim 65 as being anticipated by Reese Jr. (U.S. Patent No. 5,667,866), 35 U.S.C. 103(a) rejection of Claims 21 – 22, 25 – 26, 28 – 33 and 36 – 41 as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese (U.S. Patent No. 4,546,880), 35 U.S.C. 103(a) of Claims 23 – 24, 27, 45 – 48 and 52 – 57as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese (U.S. Patent No. 4,546,880) and further in view of Reese Jr. (U.S. Patent No. 5,667,866), 35 U.S.C. 103(a) rejection of Claims 42 – 44 and 60 as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese Jr. (U.S. Patent No. 5,667,866), 35 U.S.C. 103(a) rejection of Claims 49 – 51as being unpatentable over Kawai (European Patent No. 0528131) in view of Komai et al. (U.S. Patent No. 6,238,783), 35 U.S.C. 103(a) of Claims 58 – 59 as being unpatentable over Kawai (European Patent No. 0528131) in view of Reese (U.S. Patent No. 4,546,880) and Reese Jr. (U.S. Patent No. 5,667,866) and further in view of Clark (U.S. Patent No. 6,004,652) above are directed to amended Claims 20 – 60 and 65.

Applicant's arguments regarding the 35 U.S.C 112 second paragraph rejections of Claims 26, 32, 39 and 42, of record on page 2 of the previous Action, have been carefully considered but have not been found to be persuasive for the reasons set forth below.

Applicant argues, on page 5 of Paper No. 6, that the terms 'high tenacity' and 'high modulus,' when used in connection with fibers, are well known expressions in the art. However, the terms refer to different ranges of moduli and tenacity in the art, thus the term is relative.

Applicant also argues, on page 6, that the term 'a main direction of forces acting on the insert' has proper antecedent basis. However, no forces, or the action of forces, are claimed in Claim 20.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc Patterson, whose telephone number is (703) 305-3537. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM. If attempts to reach the examiner by phone are unsuccessful, the examiner's supervisor, Harold Pyon, can be reached at (703) 308-4251. FAX communications should be sent to (703) 872-9310. FAXs received after 4 P.M. will not be processed until the following business day.

Marc A. Patterson, PhD.
Marc Patterson
Art Unit 1772

HAROLD PYON
SUPERVISORY PATENT EXAMINER
10/1/02